

U.S.S.N. 09/760,046
Filed: January 12, 2001
AMENDMENT AND RESPONSE TO OFFICE ACTION

In the Claims

1. (Currently Amended) A method for making dry, micronized particles of an agent, comprising:

(a) dissolving a macromolecular material in an effective amount of a solvent, to form a solution;

(b) dissolving or dispersing the agent in the solution to form an emulsion and thereby micronize the particles of the agent;

(c) freezing the ~~mixture~~ emulsion;

(d) drying by vacuum the ~~mixture~~ emulsion to form solid micronized particles of the agent dispersed in solid macromolecular material; and

(e) ~~separating the solid micronized particles of agent from the macromolecular material~~
dissolving the macromolecular material in an effective amount of a solvent for the
macromolecular material to form a dispersion of microparticles in the solvent, wherein the
solvent is a non-solvent for the agent.

Claim 2 (canceled).

3. (Previously presented) The method of claim 1 further comprising encapsulating the solid particles of agent in an encapsulating material.

4. (Previously presented) The method of claim 1 wherein greater than 90% solid particles are less than 0.2 μm in diameter.

Claim 5 (canceled).

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6. (Previously presented) The method of claim 1 wherein greater than 90% of the solid particles are between 10 nm and 1 μ m in diameter.
7. (Original) The method of claim 1 wherein the agent is a bioactive agent.
8. (Original) The method of claim 7 wherein the bioactive agent is a protein.
9. (Original) The method of claim 8 wherein the protein is a growth hormone.
10. (Original) The method of claim 8 wherein the protein is an osteoprotegerin.
11. (Original) The method of claim 7 wherein the agent is selected from the group consisting of peptides, antibiotics, nucleotide molecules, and synthetic drugs.
12. (Original) The method of claim 1 wherein the macromolecular material is a polymer.
13. (Original) The method of claim 12 wherein the polymer is selected from the group consisting of polymers of lactic acid and glycolic acid, polyanhydrides, poly(ortho)esters, polyurethanes, poly(butic acid), poly(valeric acid), poly(caprolactone), poly(hydroxybutyrate), poly(lactide-co-glycolide), poly(lactide-co-caprolactone), and blends and copolymers thereof.
- Claim 14 (canceled).
15. (Original) The method of claim 1 wherein step (d) utilizes lyophilization.
16. (Previously presented) The method of claim 3 wherein the encapsulation is ~~conducting~~ conducted using a process selected from the group consisting of interfacial polycondensation, spray drying, hot melt microencapsulation, and phase separation techniques.

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17. (Previously presented) The method of claim 16 wherein the phase separation technique is selected from the group consisting of solvent extraction, solvent evaporation, and phase inversion.

18. (Currently amended) The method of claim 17 ~~wherein the mixture has a continuous phase containing the solvent and~~ wherein the phase inversion technique comprises:

introducing the ~~mixture~~ dispersion into a nonsolvent, wherein the volume ratio of solvent:nonsolvent is at least 1:40, to cause the spontaneous formation of a microencapsulated product, wherein the solvent and the nonsolvent are miscible.

19. (Previously presented) The method of claim 18 wherein the solvent and non-solvent are slightly miscible.

20. (Original) The method of claim 18 wherein the volume ratio of solvent:nonsolvent is between 1:50 and 1:200.

21. (Currently amended) The method of claim 18 wherein the macromolecular material is dissolved in the solvent at a concentration of less than 10% weight per volume and wherein the ~~mixture has a viscosity of~~ the macromolecular material in the solvent is less than 3.5 cP.

22. (Original) The method of claim 20 wherein the concentration of the macromolecular material in the solvent is between 0.5 and 5% weight per volume.

23. (Currently amended) The method of claim 8 wherein freezing of the ~~mixture~~ emulsion is performed following addition of the agent to the solution at a rate effective to avoid denaturing of the protein.

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24. (Canceled)

25. (Original) The method of claim 3 wherein the encapsulating material is a biocompatible polymer.

26. (Original) The method of claim 25 wherein the biocompatible polymer is selected from polyesters, polyanhydrides, polystyrenes, poly(ortho)esters, copolymers thereof, and blends thereof.

Claims 27-33 (Canceled).

34. (Previously presented) The method of claim 1 wherein greater than 90% solid particles are less than 1 μm in diameter.

35. (New) The method of claim 1, further comprising separating the solid micronized particles of agent from the macromolecular material.